High Power Density Surface Mount PAR® Transient Voltage Suppressors

eSMP® Series

SMP (DO-220AA)

Anode ○—▶|—○ Cathode

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
V_{BR}	6.8 V to 43 V
V_{WM}	5.8 V to 36.8 V
P_{PPM} (for V_{BR} 6.8 V)	250 W
P_{PPM} (for V_{BR} 7.5 V to 12 V)	300 W
P_{PPM} (for V_{BR} 13 V to 43 V)	400 W
P_D	2.5 W
I_{FSM}	40 A
T_J max.	185 °C
Polarity	Unidirectional
Package	SMP (DO-220AA)

FEATURES

AUTOMOTIVE GRADE

RoHS COMPLIANT

HALOGEN FREE

- Junction passivation optimized design passivated anisotropic rectifier technology
- T_J = 185 °C capability suitable for high reliability and automotive requirement
- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Unidirection only
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

Protection for ICs, drive transistors, signal lines of sensor units, and electronic units in consumer, computer, industrial, and automotive applications.

MECHANICAL DATA

Case: SMP (DO-220AA)
Molding compound meets UL 94 V-0 flammability rating
Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified (“X” denotes revision code e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNIT
Peak power dissipation with a 10/1000 µs waveform (fig. 1 and 3) (1)(2)	P_{PPM}	See table next page	W
Peak power pulse current with a 10/1000 µs waveform (fig. 1) (1)	I_{PPM}	See table next page	A
Power dissipation on infinite heatsink, T_A = 75 °C	P_D	2.5	W
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	40	A
Maximum instantaneous forward voltage at 25 A (3)	V_F	2.5	V
Operating junction and storage temperature range	T_J, T_{STG}	-65 to +185	°C

Notes

(1) Non-repetitive current pulse, per fig. 3 and derated above T_A = 25 °C per fig. 2
(2) Mounted on PCB with 5.0 mm x 5.0 mm copper pads attached to each terminal
(3) Pulse test: 300 µs pulse width, 1 % duty cycle

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

DEVICE TYPE	DEVICE MARKING CODE	BREAKDOWN VOLTAGE V_{BR} (1) AT I_T (V)		TEST CURRENT I_T (mA)	STAND-OFF VOLTAGE V_{WM} (V)	MAXIMUM REVERSE LEAKAGE AT V_{WM} I_R (µA)	MAXIMUM REVERSE LEAKAGE AT V_{WM} T_J = 150 °C I_D (µA)	MAXIMUM PEAK PULSE SURGE CURRENT I_{PPM} (2) (A)	MAXIMUM CLAMPING VOLTAGE AT I_{PPM} V_C (V)	MAXIMUM TEMPERATURE COEFFICIENT OF V_{BR} (%/°C)
		MIN.	MAX.							
TPSMP6.8A	AEP	6.45	7.14	10.0	5.80	300	1000	23.8	10.5	0.057
TPSMP7.5A	AGP	7.13	7.88	10.0	6.40	150	500	26.5	11.3	0.061
TPSMP8.2A	AKP	7.79	8.61	10.0	7.02	50.0	200	24.8	12.1	0.065
TPSMP9.1A	AMP	8.65	9.55	1.0	7.78	10.0	50.0	22.4	13.4	0.068
TPSMP10A	APP	9.50	10.5	1.0	8.55	5.0	20.0	20.7	14.5	0.073
TPSMP11A	ARP	10.5	11.6	1.0	9.40	2.0	10.0	19.2	15.6	0.075
TPSMP12A	ATP	11.4	12.6	1.0	10.2	1.0	5.0	18.0	16.7	0.078
TPSMP13A	AVP	12.4	13.7	1.0	11.1	1.0	5.0	22.0	18.2	0.081
TPSMP15A	AXP	14.3	15.8	1.0	12.8	1.0	5.0	18.9	21.2	0.084
TPSMP16A	AZP	15.2	16.8	1.0	13.6	1.0	5.0	17.8	22.5	0.086
TPSMP18A	BEP	17.1	18.9	1.0	15.3	1.0	5.0	15.9	25.5	0.088
TPSMP20A	BGP	19.0	21.0	1.0	17.1	1.0	5.0	14.4	27.7	0.090
TPSMP22A	BKP	20.9	23.1	1.0	18.8	1.0	5.0	13.1	30.6	0.092
TPSMP24A	BMP	22.8	25.2	1.0	20.5	1.0	5.0	12.0	33.2	0.094
TPSMP27A	BPP	25.7	28.4	1.0	23.1	1.0	5.0	10.7	37.5	0.096
TPSMP30A	BRP	28.5	31.5	1.0	25.6	1.0	5.0	9.7	41.4	0.097
TPSMP33A	BTP	31.4	34.7	1.0	28.2	1.0	5.0	8.8	45.7	0.098
TPSMP36A	BVP	34.2	37.8	1.0	30.8	1.0	5.0	8.0	49.9	0.099
TPSMP39A	BXP	37.1	41.0	1.0	33.3	1.0	5.0	7.4	53.9	0.100
TPSMP43A	BZP	40.9	45.2	1.0	36.8	1.0	5.0	6.7	59.3	0.101

Notes

(1) V_{BR} measured after I_T applied for 300 µs, I_T = square wave pulse or equivalent

(2) Surge current waveform per fig. 3 and derated per fig. 2

(3) All terms and symbols are consistent with ANSI/IEEE C62.35

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TPSMP6.8AHM3_A/H (1)	0.024	H	3000	7" diameter plastic tape and reel
TPSMP6.8AHM3_A/I (1)	0.024	I	10 000	13" diameter plastic tape and reel

Note

(1) Automotive grade

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C, unless otherwise noted)

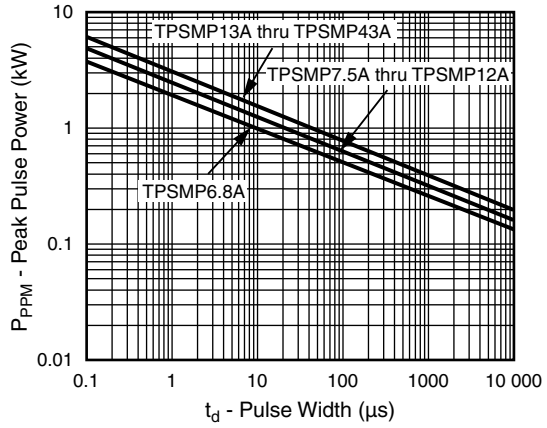

Fig. 1 - Peak Pulse Power Rating Curve

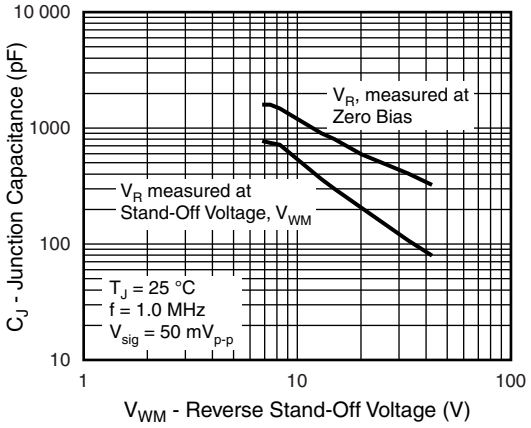

Fig. 4 - Typical Junction Capacitance

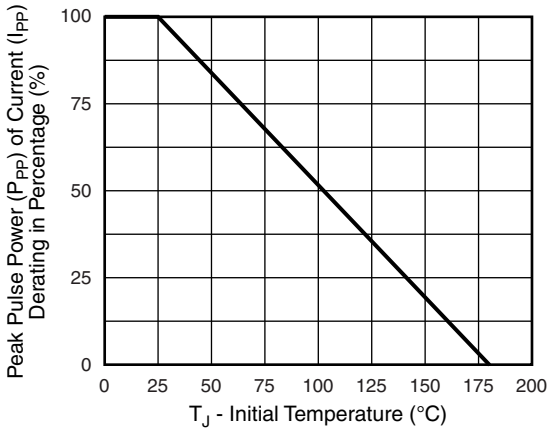

Fig. 2 - Pulse Derating Curve

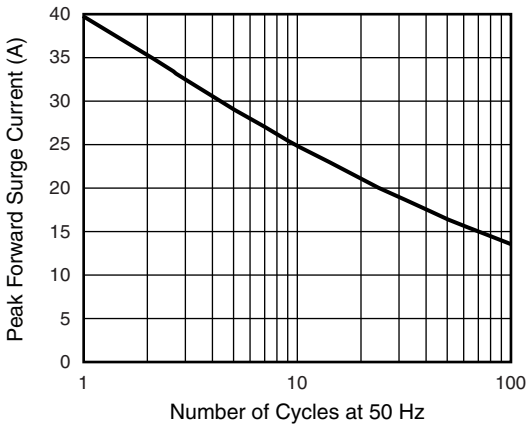

Fig. 5 - Maximum Peak Forward Surge Current

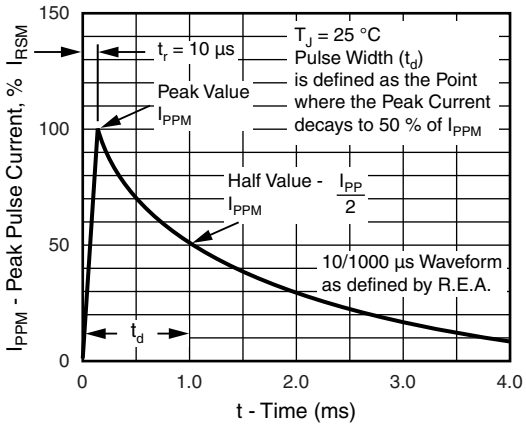

Fig. 3 - Pulse Waveform

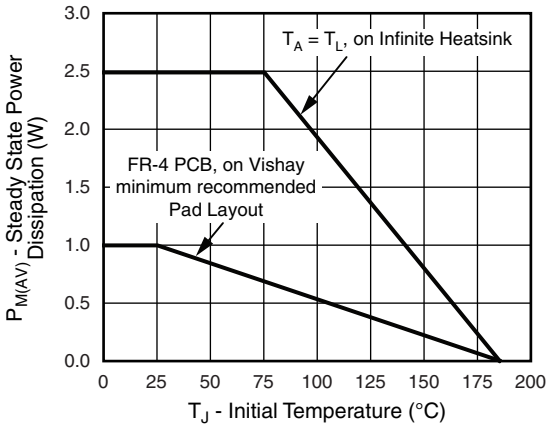

Fig. 6 - Steady State Power Derating Curve

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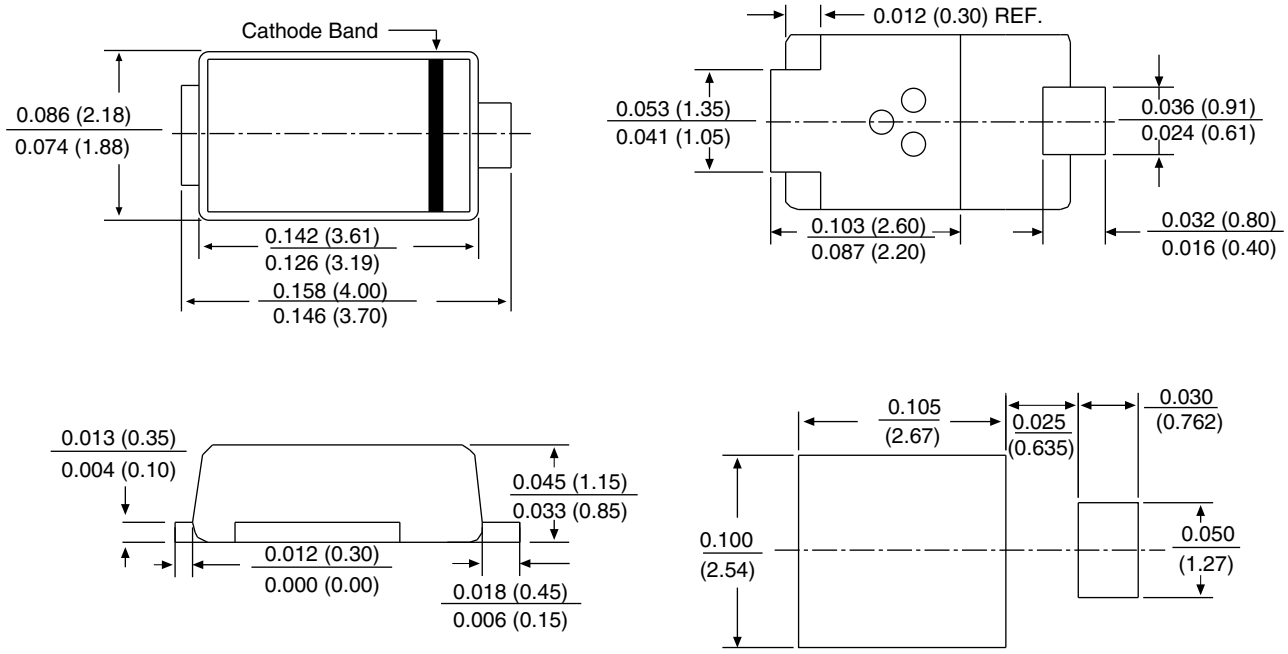
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)



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